

REMARKS

This application has been carefully reviewed in light of the Office Action dated October 7, 2003 (Paper No. 22). Claims 1 to 10, 12 to 18, 40 and 42 to 79 are currently in the application, of which Claims 1, 12, 42, 49, 63 to 68, 70, 72, 74, 75, 77 and 79 are the independent claims. Reconsideration and further examination are respectfully requested.

Initially, Applicant thanks the Examiner for the indication that Claims 1 to 10, 56, 63, 67 and 74 have been allowed.

Claims 71 and 78 were objected to for informalities. Applicant has amended these claims to attend to the informalities. Withdrawal of the objection to these claims is respectfully requested.

Claims 40, 42, 43, 48, 58, 65, 70, 71, 73/70, 77 and 78 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 4,424,442 (Kitamura); Claims 12, 13, 18, 49, 50, 55, 57, 59, 64, 66, 68, 69, 72, 73/72, 75, 76 and 79 were rejected under § 103(a) over Kitamura in view of U.S. Patent No. 4,978,977 (Ohmori); Claims 15, 52, 60 and 62 were rejected under § 103(a) over Kitamura in view of Ohmori and further in view of U.S. Patent No. 6,124,962 (Kamikubo); Claims 45 and 61 were rejected under § 103(a) over Kitamura in view of Kamikubo; Claims 14 and 51 were rejected under § 103(a) over Kitamura in view of Ohmori and further in view of U.S. Patent No. 5,365,259 (Kanoto); Claims 16, 17, 53 and 54 were rejected under § 103(a) over Kitamura in view of Ohmori and Kamikubo and further in view of Kanoto; Claim 44 was rejected under § 103(a) over Kitamura in view of Kanoto; and Claims 46 and 47 were rejected under § 103(a) over Kitamura in view of Kamikubo and further in view of Kanoto.

Applicant has considered the Examiner's comments together with the applied references and respectfully submits that the claims herein are patentably distinguishable over the applied references for at least the following reasons.

Independent Claims 12, 64, 68 and 75 each include the feature of a first detection optical element having a refractive power at least in a main-scanning direction, where the first detection optical element converges at least one of a plurality of deflected light beams as at least one detection light beam. The first detection optical element has its optical surfaces arranged orthogonally relative to an arrangement direction of the at least one detection light beam.

Independent Claims 42, 65, 70 and 71 each include the feature of a detection optical element for converging at least one detection light beam and leading it to a photodetector, where the detection optical element has a refractive power in the main-scanning direction. The detection optical element has its optical surfaces arranged orthogonally relative to an arrangement direction of the at least one detection light beam.

The applied references are not seen to disclose or suggest the foregoing features of the present invention. In particular, the applied references are not seen to disclose or suggest at least the feature of a detection optical element having a refractive power in a main-scanning direction, where the detection optical element has its optical surfaces arranged orthogonally relative to an arrangement direction of at least one detection light beam.

Kitamura concerns a scanning apparatus in which a surface is scanned using multiple light beams. The Office Action contended that the cylindrical lens 10 described in

Kitamura corresponds with the detection optical element of the present invention.

Applicant respectfully disagrees with this characterization of cylindrical lens 10.

As shown in Figures 4A and 4B of Kitamura, cylindrical lens 10 is not seen to have a refractive power in a main-scanning direction. Rather, cylindrical lens 10 is seen to have a refractive power in a sub-scanning direction, while imaging lens 4 provides a refractive power in the main-scanning direction. Even if imaging lens 4 corresponded with the claimed detection optical element, which Applicant does not concede, as shown in Figure 1 the light beams which are detected by photodetector element 5 are seen to pass through optical surfaces of imaging lens 4 which are not arranged orthogonally relative to an arrangement direction of those light beams.

While column 2, lines 21 to 30, of Kitamura describe the use of an anamorphic optical element being disposed in front of the photodetector element, nothing in Kitamura is seen to disclose or suggest that the optical surfaces of the anamorphic optical element are arranged orthogonally, relative to an arrangement direction of the light beams detected by photodetector element 5. Therefore, Kitamura is not seen to disclose or suggest at least the feature of a detection optical element having a refractive power in a main-scanning direction, where the detection optical element has its optical surfaces arranged orthogonally relative to an arrangement direction of at least one detection light beam.

Ohmori was applied in combination with Kitamura in the § 103(a) rejection of Claims 12, 64, 68 and 75. The Office Action contended that one of ordinary skill in the art would have been motivated to combine the detection lenses taught by Ohmori with the

system described in Kitamura to focus the detection beam and diminish synchronization errors. Applicant respectfully disagrees that one of ordinary skill in the art would look to Ohmori to remedy deficiencies in Kitamura. Kitamura concerns a scanning method that uses a plurality of light beams. When designing an optical system used in a scanning system for multiple light beams, considerations must be made in addition to those made designing a scanning system using a single light beam. Applicant submits that one of ordinary skill in the art would not have been motivated to look to single beam scanning system described in Ohmori to solve problems in an optical system for a multiple beam scanning system such as the one described in Kitamura. Accordingly, Applicant submits that the combination of Ohmori with Kitamura was improper for purposes of a rejection under § 103(a).

Kamikubo and Kanoto, which were applied in the rejections of certain dependent claims are not seen to disclose or suggest anything to remedy the foregoing deficiencies of Kitamura and Ohmori. Specifically, neither Kamikubo nor Kanoto, either alone or in combination with Kitamura and Ohmori, are seen to disclose or suggest at least the feature of a detection optical element having a refractive power in a main-scanning direction, where the detection optical element has its optical surfaces arranged orthogonally relative to an arrangement direction of at least one detection light beam.

Accordingly, independent Claims 12, 42, 64, 65, 68, 70, 75 and 77 are believed to be allowable over the applied references. Reconsideration and withdrawal of the § 102(b) rejection of Claims 42, 65, 70 and 77 and the § 103(a) rejection of Claims 12, 64, 68 and 75 are respectfully requested.

Independent Claims 49, 66, 72 and 79 each include the feature of a photodetector for controlling the timing of a start of scanning a plurality of light beams on a surface being held optically equivalent to the center of a scanning width in the main-scanning direction on the surface. This feature of the invention is not seen to be disclosed or suggested in the applied references.

As conceded in the Office Action, Kitamura is not seen to disclose or suggest that the photodetector element 5 is held optically equivalent with the center of a scanning width in the main-scanning direction of the surface of drum 6. For this reason, Ohmori was combined with Kitamura in the rejection of the claims. As described above, Applicant contends that the combination of Ohmori with Kitamura was improper. However, even if this combination were proper, Ohmori is not understood to remedy the foregoing deficiency of Kitamura.

As described in the Background of the Invention and the Summary of the Invention of Ohmori, the laser scanner described therein is designed to overcome the limitations of having to provide a sensor at a position equivalent to the image receiving surface to be scanned by the laser. In column 2, lines 49 to 53, of Ohmori, the laser scanner is described as being designed such that a position A in the optical path before the sensor (not the sensor itself) and the surface of a photosensitive member are equivalent.

Even if Ohmori were to describe the sensor and the surface of the photosensitive member as being held optically equivalent, Ohmori is not understood to disclose or suggest where on the surface of the photosensitive member the sensor was optically equivalent. Therefore, Ohmori is not understood to disclose or suggest at least the feature of a photodetector for controlling the timing of a start of scanning a plurality of

light beams on a surface being held optically equivalent to the center of a scanning width in the main-scanning direction on the surface.

Kamikubo and Kanoto, which were applied in the rejections of certain dependent claims are not seen to disclose or suggest anything to remedy the foregoing deficiencies of Kitamura and Ohmori. Specifically, neither Kamikubo nor Kanoto, either alone or in combination with Kitamura and Ohmori, are seen to disclose or suggest at least the feature of a photodetector for controlling the timing of a start of scanning a plurality of light beams on a surface being held optically equivalent to the center of a scanning width in the main-scanning direction on the surface.

Accordingly, independent Claims 49, 66, 72 and 79 are believed to be allowable over the applied references. Reconsideration and withdrawal of the § 103(a) rejection of Claims 49, 66, 72 and 79 are respectfully requested.

The other rejection claims in the application are dependent from the independent claims discussed above and therefore are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, California, office by telephone at (714) 540-8700. All correspondence should be directed to our address given below.

Respectfully submitted,

  
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